Patent Claims

1. Method for producing a thermal paper comprising a carrier substrate, an intermediate pigment coat, a thermal reaction layer and, optionally, one or several additional intermediate coats and/or top coats, wherein the intermediate pigment coat is formed via the curtain-coating method with an aqueous suspension containing pigments, binding agents and, optionally, additional application additives, characterized in that an aqueous application suspension containing calcined kaolin having a solid matter contents of approximately 25 to 75% by weight is applied by means of the curtain-coating method at an operating speed of at least 500 m/min and dried.

2. Method according to Claim 1, characterized in that the solid matter contents of the application suspension lies between approximately 35 and 60 % by weight.

3. Method according to Claim 1 or 2, characterized in that the drop heights of the aqueous application suspension containing the calcined kaolin is adjusted during execution of the curtain-coating method to approximately 5 to 34 cm, in particular to approximately 8 to 20 cm.

4. Method according to one of Claims 1 to 3, characterized in that the application suspension containing the calcined kaolin is adjusted to a viscosity of approximately 150 to 1500 mPas (Brookfield, 100 U/min, 25°C), in particular of approximately 250 to 900 mPas.

5. Method according to one of Claims 1 to 4, characterized in that the surface tension of the application suspension containing the calcined kaolin is adjusted to approximately 23 to 60 mN/m, in particular to approximately 27 to 40 mN/m (static ring method according to Du Noüy).

6. Method according to one of Claims 1 to 5, characterized in that as carrier substrate a customary carrier paper, a synthetic carrier paper and/or a plastic foil is used, with the paper carrier in particular presenting a basis weight of approximately 40 to 120 g/m^2.

7. Method according to Claim 6, characterized in that the paper carrier contains for stabilization of dimensions synthetic fibers in addition to natural cellulose fibers, with the long fiber percentage amounting up to approximately 40% by weight, in particular to approximately 5 to 40% by weight, and the short fiber percentage amounting to approximately 60 to 95% by weight, in particular to approximately 60 to 80% by weight.

8. Method according to at least one of the preceding Claims, characterized in that into the application suspension containing the calcined kaolin are incorporated customary additives in the form of processing auxiliaries, in particular in form of surface-active substances, retention auxiliaries and/or rheology auxiliaries.

9. Method according to Claim 8, characterized in that the surface-active substances are employed in the form of C_2-C_{12}-di-alkylsulfosuccinate-alkali salts or siloxanes, the retention auxiliaries in the form of carboxy-methyl celluloses or poly-acrylamides and/or the rheology auxiliaries in the form of higher molecular, water-soluble starch derivatives, carboxy-methyl celluloses, sodium alginates, polyvinyl alcohols or poly(meth)acrylates.

10. Method according to at least one of the preceding Claims, characterized in that the calcined kaolin of the aqueous application suspension presents a particle size of approximately 0.1 to 10 µm, in particular of approximately 0.1 to 2 µm.

11. Method according to at least one of the preceding Claims, characterized in that the aqueous application suspension containing

calcined kaolin contains a binding agent in the form of water-soluble starches, starch derivatives, hydroxyl-ethyl-celluloses, polyvinyl-alcohols, modified polyvinyl-alcohols, sodium-polyacrylates, acrylamide-(meth)acrylate-co-polymers, acrylamide-acrylate-methacrylate-terpolymers, alkali salts of styrene-maleic anhydride-co-polymers, alkali salts of ethylene-maleic anhydride-co-polymers and/or lattices such as poly-acrylate, styrene-butadien-co-polymers, polyurethanes, acrylate-butadien-co-polymers, polyvinyl-acetate and/or acryl-nitril-butadien-co-polymers.

12. Method according to at least one of the preceding Claims, characterized in that the application weight of the aqueous application suspension containing the calcined kaolin is adjusted to up to approximately 30 g/m^2, relative to the dry substance, in particular to up to approximately 25 g/m^2.

13. Method according to Claim 12, characterized in that the application weight of the aqueous application suspension containing the calcined kaolin is adjusted to up to approximately 2 to 20 g/m^2, relative to the dry substance, in particular to approximately 4 to 8 g/m^2.

14. Method according to at least one of the preceding Claims, characterized in that on the intermediate pigment coat, optionally after drying, there are formed one or several additional intermediate pigment coats by means of the curtain-coating method.

15. Method according to at least one of the preceding Claims, characterized in that on the intermediate pigment coat or intermediate pigment coats there is formed simultaneously on-line, or in a separate spreader step off-line, a thermal reaction layer by means of the curtain-coating method or by means of a roller coating method or by means of a roller spread coating method or by means of an air brush method.

16. Method according to claim 15, characterized in that into the aqueous

application suspension utilized for forming the thermal reaction layer are incorporated color developers, color formers, sensitizing melt auxiliaries, anti-aging means, binding agents and customary additives, such as in particular slip additives, rheological auxiliaries, optical brighteners and/or fluorescent substances.

17. Method according to one of Claims 15 to 16, characterized in that the drop height of the aqueous application suspension for the formation of the thermal reaction coat is adjusted to approximately 5 to 35 cm during execution of the curtain-coating method, in particular to approximately 8 to 20 cm.

18. Method according to at least one of Claims 15 to 17, characterized in that the application suspension for the formation of the thermal reaction layer is adjusted to a viscosity of approximately 150 to 1500 mPas (Brookfield, 110 U/min, 25° C) in particular to approximately 250 to 900 mPas.

19. Method according to at least one of Claims 15 to 18, characterized in that the surface tension of the application suspension for the formation of the thermal reaction layer is adjusted to approximately 23 to 60 mN/m, in particular to approximately 30 to 40 mN/m (statical ring method according to Du Noüy).

20. Method according to at least one of Claims 15 to 19, characterized in that the dried thermal reaction layer is adjusted using customary smoothing means to a Bekk smoothness of approximately 100 to 1200 s, in particular of approximately 300 to 700 s, measured according to DIN 53101.

21. Method according to at least one of Claims 15 to 20, characterized in that the aqueous application suspension utilized for the formation of the thermal reaction coat contains, in addition, further pigments.

22. Method according to Claim 21, characterized in that the pigments

represent inorganic extender pigments, in particular clays, magnesium carbonates, sodium aluminum silicates, aluminum oxides, aluminum silicate, silicic acid, siliceous earth, magnesium silicates, titanium dioxides, calcium carbonates of synthetic as well as natural origin.

23. Method according to Claim 22, characterized in that the extender pigments have an average particle size of approximately 0,1 to 10 µm, in particular approximately 0,1 to 2 µm.

24. Method according to at least one of Claims 14 to 23, characterized in that on the thermal reaction layer, additional layers are formed on-line or off-line as protective coat and/or as coat to enhance the capability of being printed on.

25. Method according to at least one of the preceding Claims, characterized in that the curtain-coating method is operated at a speed of more than 750 m/min.

26. Method according to Claim 25, characterized in that the curtain-coating method is operated at a speed of at least approximately 1000 m/min, in particular approximately 1500 m/min.

27. Method according to at least one of the preceding Claims, characterized in that the clear exit gap width of the curtain spreader head of the curtain-coating method is adjusted to approximately 0.1 to 1 mm, in particular to approximately 0.2 to 0.6 mm, and/or the nozzle through-puts for the respective application suspension are adjusted to approximately 0.3 to 15.1 cm^3 (cm working width x s), in particular to approximately 0.5 to 5.0 cm^3/(cm x s) with the curtain spreader head being adjustable to accommodate a single- or multiple gap.